

Fuel Cell Test Bench

Stack & Complete System Testing



This bench tests the functionality and performance of fuel cell stacks before they are integrated into a complete system. Tests are run with hydrogen and air under simulated real operating conditions, with full control of reactant flow, pressure, humidity and temperature.

The bench can also test complete fuel cell systems, validating stack performance within the actual power generation assembly. It is suited both to R&D laboratories and to quality audits on the production line.

THE SYSTEM

The test bench is suited both to laboratory use and to production-line audits, where it verifies the quality of the stack manufacturing process.

Its flexible design accepts fast automotive connectors, which simplify stack loading and unloading.

- > Manual stack loading and unloading
- > Quick-release clamp connections
- > Hydrogen recirculation loop



1. Hydrogen Conditioning Loop



2. Air Conditioning Loop

MAIN FEATURES

The bench runs a wide range of tests on the stack, both to characterize its performance and to detect manufacturing defects quickly.

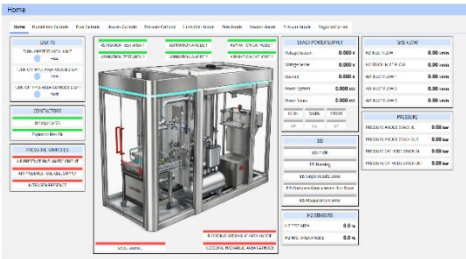
- > Multi-condition performance tests
- > Impedance spectroscopy (EIS)
- > Cell voltage monitoring (CVM)
- > Testing of complete fuel cell systems

TECHNICAL SPECIFICATIONS

- > Anode flow rate: 20 – 1000 l/min
- > Cathode flow rate: 60 – 3000 l/min
- > Gas inlet pressure control: 1 – 6 bara
- > Back-pressure control: 1 – 6 bara
- > Relative humidity control: 25 – 90% RH
- > Gas temperature control: 25 – 100 °C
- > Stack temperature control: 25 – 120 °C
- > Voltage: 0 – 240 V
- > Current: 0 – 1000 A

THE SOFTWARE

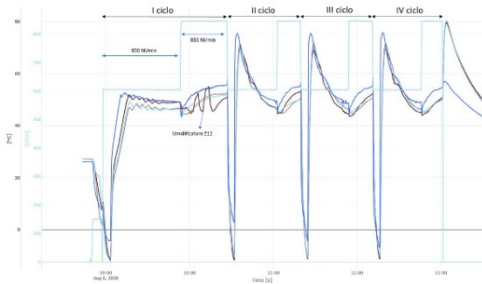
The software runs on Loccioni's **Aulos** platform, a suite of two applications: **Aulos Automation**, the desktop HMI used to monitor and control the hardware and run test routines, and **Aulos Supervisor**, which collects data and results from the test benches and manages their programs and configurations.



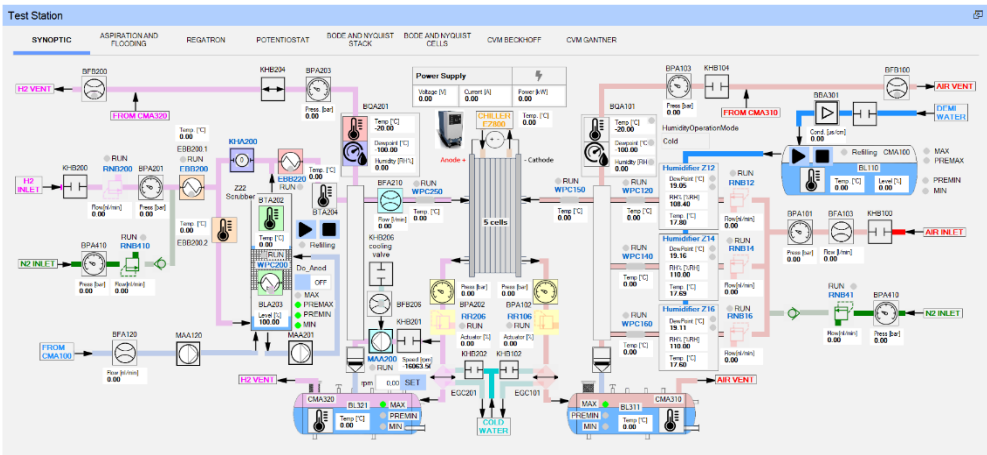
3. Home Panel

Main functions:

- > User access management
- > Hardware monitoring and calibration
- > Manual debug mode
- > Real-time dashboard
- > Program editor
- > Program execution
- > Automatic cycling
- > Results analysis
- > Stack health analysis
- > Data maintenance tool



4. Data Logging Charts



5. Synoptic View

LOCCIONI